Remarks

Claims 1-20 are pending in the application, and each was rejected. By this paper, claims 1, 13 and 18 are amended. Based on the following, consideration of the amended claims, and reconsideration of the remaining claims, are requested.

Claim Objections

The Examiner objected to claims 2-12, 14-17, 19 and 20 because of certain informalities. In particular, the Examiner stated that if the "first vehicle condition" is vehicle deceleration, it was unclear how the second vehicle condition could be vehicle speed, "if the second vehicle condition reaches the first predetermined value and is based on the first vehicle condition." The Examiner further states that "[d]eceleration is determined or 'based on' speed, not vice-versa."

Applicants note that by this paper, claims 1, 13 and 18 are amended to more particularly point out and distinctly claim the subject matter of the invention. Applicants believe that the amendments to these independent claims help to address the Examiner's objections to the dependent claims. Applicants submit, however, that as originally written, each of the claims was clear and unambiguous. First, with regard to the Examiner's characterization of deceleration being "determined or 'based on' speed," Applicants must disagree. Deceleration is defined by a rate of change of speed, not by a particular speed. For example, a change in speed over a given time from 100 miles per hour (mph) to 80 mph, can result in the same deceleration as a change in speed over the same given time from 40 mph to 20 mph. Therefore, deceleration is not determined or based on speed; rather, it is defined as a rate of change of speed.

As applied to the claims of the present application, amended claim 1 recites the steps of "determining a first vehicle condition when the vehicle is braking...." Claim 2 recites that the first vehicle condition can include "vehicle deceleration". Amended claim 1 further

recites the step of "determining a first predetermined value corresponding to the first vehicle condition...." As clearly described in the specification—e.g., paragraph 0047—the first predetermined value can be, in one embodiment, "the vehicle speed at which the regenerative braking torque blending begins...." Paragraph 0035 of the specification, in conjunction with Figure 3, also provides an illustrative example explaining the relationship between the vehicle conditions and the first predetermined value. For example, paragraph 0035 states that "[e]ach of the points at which one of the torque curves deviates from the regen limit curve—i.e., points d, e, f and g—represents the first predetermined value, used in step 52 in Figure 2." Thus, determining the first vehicle condition—i.e., the vehicle deceleration—sets a particular point, such as d, e, f or g in Figure 3. Each of these points d, e, f and g correspond to a particular vehicle speed, which can be determined by observing the coordinate of each point along the abscissa of the graph shown in Figure 3.

Therefore, determining the vehicle deceleration (first vehicle condition) provides a means for determining a particular vehicle speed (first predetermined value). With the knowledge of the first predetermined value—e.g., the vehicle speed at which regenerative braking begins, which is based on the vehicle deceleration (first vehicle condition)—it is clear that the regenerative braking torque may be reduced to zero when the second vehicle condition (vehicle speed) reaches the first predetermined value (the predetermined vehicle speed based on the determined deceleration of the vehicle). The other dependent claims which have either claim 13 or claim 18 as their base claim, are subject to a similar analysis. Therefore, Applicants respectfully request that the objections to each of the claims be withdrawn.

Claim Rejections—35 U.S.C. § 103

The Examiner rejected claims 1-5 and 13-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,325,470 (Schneider) in view of U.S. Patent Application Publication No. 2002/0180266 (Hara et al.). The MPEP states that in order to establish *prima facie* obviousness, all of the claim limitations of an invention must be taught or suggested by the prior art. MPEP § 2143.03, 8th ed., Rev. 2. Neither Schneider nor Hara et al., alone or

in combination, teach or suggest all of the claim limitations of any of the pending claims of the current application. For example, amended claim 1 recites a method for controlling regenerative braking which includes the steps of determining first and second vehicle conditions, and "determining a first predetermined value corresponding to the first vehicle condition...." In addition, amended claim 1 recites the step of "reducing regenerative braking torque to zero beginning when the second vehicle condition reaches the first predetermined value." No such limitations are taught or suggested by the cited references.

Schneider describes a method and apparatus for proportioning regenerative braking. Values of a driver commanded brake torque (T_{BRAKE}) and an appropriate coast down torque (T_{COAST}) are determined. The method of Schneider then "sets the regenerative braking force, T_{REGEN}, equal to whichever of the magnitude of T_{COAST} or T_{BRAKE} is the greatest, thus avoiding their addition during the time period between t_1 and t_2." (Col. 4, ll. 20-56). Hara et al. describes a braking force control apparatus for a vehicle, which includes determining whether ABS control is being performed, and if so, a target regenerative braking force is set to zero. (Paragraph 0077). Moreover, the control apparatus of Hara et al. determines whether ABS control is likely to be started, and if it is, the target regenerative braking force is gradually reduced prior to the start of the ABS control. (Paragraph 0077).

Nothing in the combination of Schneider or Hara et al. teaches, or even suggests, all of the claim limitations of amended claim 1. Claim 1 recites the determination of two vehicle conditions, the determination of a predetermined value which corresponds to one of the vehicle conditions, and the step of reducing regenerative braking to zero specifically beginning when the second vehicle condition reaches the predetermined value. The invention of claim 1 specifically defines a point at which reduction of regenerative braking begins. This point occurs when a second vehicle condition reaches a predetermined value, where the predetermined value corresponds to a first vehicle condition, which has previously been determined. Nothing in the combination of Schneider and Hara et al. teaches or suggests these limitations. The same analysis holds true for the other independent claims, claims 13 and 18, each of which are amended by this paper. Amended claims 1, 13 and 18 are the base claims

for claims 2-5, 14-17 and 19-20, respectively. Each of these dependent claims contains all of the limitations of its respective base claim, as well as additional limitations which further distinguish it from the cited references. Therefore, with regard to claims 1-5 and 13-20, the MPEP requirements for a showing of *prima facie* obviousness are not met.

The Examiner rejected claims 6-12 under 35 U.S.C. § 103(a) as being unpatentable over Schneider in view of Hara et al. and further in view of U.S. Patent No. 6,309,031 (Crombez et al.), U.S. Patent No. 6,244,674 (Kuno et al.), or U.S. Patent No. 5,615,933 (Kidston et al.). Applicants start by noting that the addition of any of the last three references to the combination of Schneider and Hara et al., does not render obvious amended claim 1. Moreover, amended claim 1 is the base claim for claims 6-12, which contain all of the limitations of amended claim 1, as well as additional limitations which further distinguish them from the cited references. For example, claim 6 recites controlling regenerative braking torque according to a predetermined torque curve which is based on the first vehicle condition. Further, the predetermined torque curve includes a first point which is defined by a maximum regenerative braking torque and "the first predetermined value." The torque curve also includes a second point which is defined by zero regenerative braking torque and "the second predetermined value." Thus, claim 6 recites a very specific and clearly defined torque curve which is used to control regenerative braking torque. Although regenerative braking torque curves are discussed in some of the cited references, the Examiner has not shown how the specific torque curve recited in claim 6 is taught or suggested by any combination of the cited references.

As another example, claim 8 recites the method of claim 6 wherein "the regenerative braking torque is controlled according to at least one curve chosen from a plurality of torque curves...." Moreover, "each of the torque curves [corresponds] to the first vehicle condition and [has] corresponding first and second points, and wherein there is an inverse relationship between the first vehicle condition and the maximum regenerative braking torque." Thus, claim 8 recites a number of torque curves, each of the torque curves have corresponding first and second points as defined in claim 6, and further, claim 8 recites that

there is an inverse relationship between the first vehicle condition and the maximum regenerative braking torque. The invention as recited in claim 8 is a clearly defined method for which there is no teaching, or even suggestion, in any of the cited references, alone or in combination. Therefore, with regard to claims 6-12 the MPEP requirements for a showing of *prima facie* obviousness are not met. Accordingly, allowance of each of the pending claims is requested.

The Commissioner is hereby authorized to charge the one month Petition fee of $120.00, as well as any additional fees associated with this filing, to the Deposit Account of Ford Global Technologies LLC, No. 06-1510.

Respectfully submitted,

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